REMARKS

Reconsideration of the subject application is requested. Two changes of an editorial nature have been made to the specification as shown above. Claims 1-21 remain in the application, with claims 8-21 having been withdrawn from consideration. Claims 1-7 have been amended to remove the reference to a disk drive. Claim 1 has been further amended to specify that the buffer layer is etched to the etch stop layer. Claim 4 has been editorially amended to improve the clarity of the claim. New claims 22 and 23 have been added. New claim 22 depends from claim 1, and further specifies the planarization step. New claim 23 depends from new claim 22, and further defines the planarization step.

In Section 3 of the Detailed Action portion of the Office Action, the Restriction Requirement has been made final. The applicants hereby withdraw the traversal of the Restriction Requirement.

In Section 5 of the Detailed Action portion of the Office Action, the abstract has been objected to. This objection has been addressed by the revision of the abstract, which reduces the number of words to less than 150.

In Section 6 of the Detailed Action portion of the Office Action, claim 4 has been objected to because of an informality. This objection has been addressed through the editorial amendment of claim 4.

In Section 8 of the Detailed Action portion of the Office Action, claims 1, 2 and 5-7 have been rejected under 35 U.S.C. 102(b) as being anticipated by Bussmann et al. (CPP Giant Magnetoresistance of NiFeCo/Cu/CoFe/Cu Multilayers).

Bussmann et al. has been cited as teaching (Fig. 2) a process for manufacturing a magnetic sensor for a disk drive comprising steps of: fabricating a giant magnetoresistive stack on a surface of a layer of bottom shield material, the giant magnetoresistive stack including an etching stop layer (exposed surface after RIE etching process to form the GMR) and a buffer layer on the top of the etching stop layer as shown in Fig. 1 (a) and (b); depositing an insulating material on the giant magnetoresistive stack and the surface of a layer of bottom shield material; planarizing the insulating material to form a top surface of the insulating material lying in a plane; etching the buffer layer as shown in

Fig. 2 (c); and depositing a top shield layer on the insulating material and the giant magnetoresistive stack, the top shield layer making electrical contact with the giant magneto resistive stack as shown in Fig. 2 (d) (see also page 924 and 925). As per claim 2, Bussmann et al. was cited as showing that planarizing the insulating material is performed by the chemical machining process (CMP). As per claim 5, Bussmann et al. was cited as showing that the insulating material is made of nitride. As per claim 6, Bussmann et al. was cited as showing that the stop layer exposed surface after RIE etching process to form the GMR is made of copper. As per claim 7, Bussmann et al. was cited as showing that the buffer layer is made of nitride.

This rejection is traversed. It is respectfully submitted that the present invention as defined by amended claim 1 contains features that are neither disclosed nor suggested by the cited reference. In particular, claim 1 requires an etch stop layer positioned on an end of the giant magnetoresistive stack opposite the surface of the wafer and a buffer layer positioned on the etch stop layer. Claim 1 further requires that the buffer layer is etched to the etch stop layer. The applicants respectfully submit that Bussmann et al. does not show the step of etching the buffer layer to the etch stop layer positioned on an end of the giant magnetoresistive stack opposite the surface of the wafer. Bussmann et al. uses a chemical mechanical process (CMP) to open the top layer of the magnetic device (see the first paragraph in the second column of page 925). In addition, the Bussmann et al. process does not planarize the insulating material to form a top surface of the insulating material lying in a plane adjacent to or passing through the buffer layer, as is required in claim 1. The Bussmann et al. process relies on control of the CMP to determine the distance between the shields (that is, the sensor thickness). As discussed in the Background section of the present application, on pages 3 and 4, it is difficult to determine when to stop a CMP process.

In the present invention, the sensor thickness depends on the processes used to deposit the films and the ability of the etch to stop at the etch stop layer. The present invention planarizes the sample and etches back the buffer layer to the etch stop layer. This provides precise control of the sensor thickness. The Bussmann et al. process does not provide such precise control of the sensor thickness.

Claims 2 and 5-7 depend from claim 1 and therefore also include these

features.

In Section 10 of the Detailed Action portion of the Office Action, claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bussmann et al. in view of Thomas et al. (US PAT. 6,483,662).

Bussmann et al. has been cited as teaching the limitations as set forth above except for using a vacuum etching process for planarizing insulating material. Thomas et al. has been cited as teaching a method of making a magnetoresistive element including a process of planarizing insulating material by either CMP or other suitable etching process such as focused ion beam for planarizing the material surface to a fine level (col. 6, lines 3-25). Therefore, it was considered to have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of planarizing insulating material of Bussmann et al. by a vacuum etching process such as focused ion beam as taught by Thomas et al. for the purpose of planarizing the material surface to a fine level.

Since claim 3 depends from claim 1, this rejection is traversed for the reasons set forth above with respect to the traversal of the rejection of claim 1, and for the following reasons. The applicants' respectfully submit that it would not have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of planarizing insulating material of Bussmann et al. by a vacuum etching process such as focused ion beam as taught by Thomas et al.

Bussmann et al. specifically requires the use of a chemical mechanical process (CMP) to open the top layer of the magnetic device (see the first paragraph in the second column of page 925). The substitution of a vacuum etch process for the CMP process of Bussmann et al. would be contrary to the express teachings of Bussmann et al. There is no suggestion in the Bussmann et al. and Thomas et al. references that their teachings can be combined.

In Section 11 of the Detailed Action portion of the Office Action, claim 4 has been indicated to be allowable if rewritten in independent form. However, in view of the above discussion, such rewriting is not believed to be necessary.

In an Information Disclosure Statement dated November 7, 2001 the applications included Forms PTO/SB/08A and PTO/SB/08B. An initialed copy of Form PTO/SB/08A was received with the Office Action, but an initialed copy of Form

PTO/SB/08B was not received with the Office Action. The applicants respectfully request an initialed copy of the Form PTO/SB/08B, as a record that the technical publications listed thereon were considered in the examination of this application.

All claims in the application are believed to be in allowable form. Allowance of the application is requested.

Respectfully submitted,

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